Math152 at the University of Tennessee, Knoxville - Chat for January 27, 2016 with the course instructor, Louis Gross.

I will be online starting at 7:30PM and will be happy to answer questions regarding any aspect of the course, assignments, etc. though for this evening I suspect that questions will be mostly about Chapters 15-16. You can type in this document to ask questions.

When you ask a question, please do not use your name because this document will be saved and publicly posted after we close it. I will be on-line at least until 8:30PM but will stay on longer if there are still questions. Note that I do not know the identity of anyone posting questions - each participant shows up as “Anonymous” animal.

I am online now if there are questions - Lou

could you explain 15.1, g? Like what is the math process to follow, I am a bit confused.

Sure - for this problem the first thing to try is to plug in the value and you see that we get the difference of two fractions with 0 in the denomenator. So this is one of those indeterminant forms we mentioned - it is $\infty - \infty$. So the next thing to try is to combine the two fractions to see if there is a way to do this that changes the form so it is no longer indeterminant when you plug in x = 1. So one way to do this is simply to add the fractions together by choosing the same denomenator - which in this case is relatively easy since $1-x^2=(1-x)(1+x)$ so we take the second fraction and want to have the same denomenator as the first fraction which we can do by multiplying the second fraction by $\frac{1+x}{1+x}$ so that we get for the sum of the two fractions is $\frac{2-x-1}{1-x^2}=\frac{1-x}{1-x^2}=\frac{1}{1+x}$

so then we can plug in x=1 easily so we say

$$\lim_{x\to 1}\left(\frac{2}{1-x^2}-\frac{1}{x-1}\right)=\lim_{x\to 1}\frac{1}{x+1}=\frac{1}{2}$$

OK?

Yes, makes sense. But why did you expand 1-x^2 if its not in parenthesis?

The reason is that I saw that one of the factors of 1-x^2 is the same as the denomenator of the second fraction. If this were not true, this method would not work. But in that case, likely we wouldn't get zero in the denomenator of the second fraction - e.g. plugging in x=1 wouldn't cause the second fraction to "blow up".

Ok got it. Thank you.

My pleasure - anything else?

Not at the moment. I am still working through the problems.

I am going offline - goodnight. Lou